



SEG WORKSHOP

High Performance Computing in the Geosciences

**BERKELEY,
CALIFORNIA USA
18–21 JULY 2011**



Monday, July 18, 2011

11:00 am–4:00 pm..... **Registration, UC–Berkeley**

AFTERNOON SESSION

- 1:00pm **Welcome:** *Masoud Nikraves*
(UC–Berkeley and LBNL)
- 1:05-1:45 pm **Computational Science and HPC at ExxonMobil**, *Thomas Halsey (ExxonMobil)*
- 1:45-2:30 pm **Stencil Computation on GPUs for Seismic Migration**, *Paulius Micikevicius (Nvidia)*
- 2:30-3:15 pm **GreenWave: An Energy-Efficient Architecture for Seismic Imaging**, *David Donofrio (LBNL)*
- 3:15-3:30 pm **Coffee Break**
- 3:30-4:15 pm **Accelerating GPU-based Computing over InfiniBand**, *Gilad Shainer (Mellnox)*
- 4:15-5:00 pm **Large-scale Geophysical Electromagnetic Imaging and Modeling on Graphical Processing Units**, *Micheal Commer (LBNL)*
- 6:30-8:30 pm **Ice Breaker/Welcome Reception**, *The Claremont Hotel*

Tuesday July 19, 2011

MORNING SESSION

- 9:00-9:15 am **Welcome and Opening Remarks**, *Masoud Nikraves*
(UC-Berkeley, LBNL) and Biondo Biondi (Stanford)
- 9:15-10:00 am **Exascale Opportunities and Challenges**, *Kathy Yelick (LBNL)*
- 10:00-10:45 am **High Performance Computing: Perspective of a Seismic Processor and Imager**, *Richard Clarke (BP)*
- 10:45-11:00 am **Coffee Break**
- 11:00-11:30 am **A Large Scale, Commercial, Implementation of Seismic Imaging Algorithms on GPUs**, *Dave Nichols (SLB)*
- 11:30-12:00 pm **Accelerate TTI RTM on CPU/GPU-hybrid Systems**, *Wei Liu (Chevron)*
- 12:00-12:30 pm **Seismic Imaging on GPU**, *Paulo Roberto Souza (Petrobras)*
- 12:30-1:45 pm **Lunch on your own**

AFTERNOON SESSION

- 1:45-2:30pm **Accelerating Reservoir Simulation with GPUs**, *Ken Esler (Stone Ridge Technology)*
- 2:30-3:00pm **State of the Art and Future of Integrated Petroleum Systems Modeling**, *Marek Kaciewicz (Chevron)*
- 3:00-3:30pm **Lattice Boltzmann Multi-phase Simulations in Porous Media Using GPUs**, *Jonas Toelke (Ingrain)*
- 3:30-3:45pm **Coffee Break**
- 3:45-4:15pm **Fitting Two Imaging Algorithms to Hardware Accelerator Paradigms**, *Guido Satta (CRS4.it)*
- 4:15-5:00pm **Data as a Service – Approaches to Scaling, Analyzing and Managing Big Data**, *David Teszler (Oracle)*

Free Night- Dinner on your own

Wednesday July 20, 2011

MORNING SESSION

- 9:00-9:15 am **Welcome**, *Bin Wang (TGS-Nopec)*
- 9:15-10:00 am **SEG SEAM Project Phase II-- Challenges in Land Seismic Modeling**, *Mike Oristaglio, SEAM Project/ Manager (Yale University)*
- 10:00-10:45 am **Challenges and Solutions for Visual Data Analysis on Current and Emerging HPC Platforms**, *Wes Bethel (LBNL) and Hank Childs (LBNL)*
- 10:45-11:00 am **Coffee Break**
- 11:00-11:30 am **Immersive Visualization, the New Challenge**, *Jürgen Rurainsky (Fraunhofer Heinrich Hertz Institute)*
- 11:30-12:00 pm **New Approach to Joint Geophysical Imaging of Electrical and Seismic Data in Hydrocarbon Exploration**, *Greg Newman (LBNL)*
- 12:00-12:30 pm **Microseismic/Hydro-fracturing**, *Shawn Maxwell (SLB)*
- 12:30-1:45 pm **Lunch on your own**

AFTERNOON SESSION

- 1:45-2:30 pm **Accelerating Large Scale Geoscience Applications with FPGAs**, *Oliver Pell (Maxeler Technologies)*
- 2:30-3:15 pm **Geophysical Application Development on FPGAs: a Perspective from Geophysicists**, *Tamas Nemeth (Chevron) and Ray Ergas (Chevron)*
- 3:15-3:30 pm **Coffee Break**
- 3:30-4:15 pm **Mapping Algorithms to Architecture: Stream Based Computing with FPGAs**, *Bob Clapp (Stanford)*
- 4:15 -5:00 pm **Geophysics Over Accelerated Platforms**, *Marchetti Paolo (ENI)*
- 6:30-8:30 pm **Group Dinner**, *The Claremont Hotel*

Thursday July 21, 2011

MORNING SESSION

- 9:00..... **Welcome**, *Scott Morton (Hess)*
- 9:00-9:45 am **Language Support for Fork-join and Vector Parallelism**, *Arch Robison (Intel)*
- 9:45-10:15 am **Cloud Computing for Data Intensive Science**, *Keith Jackson (LBNL)*
- 10:15-10:45 am **Service-oriented Networks: Bridge between Campus and Mega-cloud Centers**, *Inder Monga (LBNL)*
- 10:45-11:00 am **Coffee Break**
- 11:00-11:45 am **Panel: Academic and National Lab Moderator:** *Bin Wang (TGSNopec)*
- 11:45-12:30 pm **Panel: Industry Panel Moderators:** *Scott Morton (Hess), Dimitri Bevc (Chevron)*
- 12:30-12:45 pm **Closing Remarks/Adjourn**, *Dimitri Bevc (Chevron)*

ORGANIZING COMMITTEE

Masoud Nikraves (UC–Berkeley and LBNL), *Scott Morton* (Hess), *Bin Wang* (TGSNopec), *Biondo Biondi* (Stanford), *Hamdi Tchelepi* (Stanford), *Dimitri Bevc* (Chevron), *Juan Meza* (LBNL)

Sponsored by



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